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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/511,787	10/15/2004	Steven Scott Crump	S697.12-0063	4806

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EXAMINER	
HUSON, MONICA A	

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/511,787	CRUMP ET AL.	
	Examiner	Art Unit	
	Monica A. Huson	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-17,19-23,25-30,33-38,40-42 and 44* is/are rejected.

7)☒ Claim(s) *6,18,24,31,32,39 and 43* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-4, 9-15, 19, 22, 27, 28, 29, and 41 are rejected under 35 USC 102(a) as being anticipated by Kotnis et al. (U.S. Patent 6,355,196). Regarding Claim 1, Kotnis et al., hereafter "Kotnis," show that it is known to carry out a method for making a prototype plastic injection molded part (Abstract), comprising the steps of providing a nonconductive plastic mold tool defining a mold cavity (Column 4, lines 1-3); injecting a liquefied ribbon of plastic material into the mold cavity at a pressure of less than 5000 psi, until the material fills the cavity (Column 4, lines 5-7; Column 5, lines 20-22); curing the plastic material in the mold cavity to form the prototype part (Column 4, lines 8-10).

Regarding Claim 2, Kotnis shows the process as claimed as discussed above in the rejection of claim 1 above, including a method wherein the mold material is injected into the mold cavity using an extrusion head (Column 5, lines 1-2, 6-8; Column 4, lines 62-65).

Regarding Claim 3, Kotnis shows the process as claimed as discussed above in the rejection of claim 1 above, including a method comprising heating the mold tool to approximately the extrusion temperature, prior to the injection step (Column 9, lines 29-40).

Regarding Claim 4, Kotnis shows the process as claimed as discussed above in the rejection of claim 1 above, including a method wherein the injection pressure is less than 2000 psi (Column 5, lines 20-22).

Regarding Claim 9, Kotnis shows that it is known to carry out a method for making a prototype plastic injection molded part (Abstract) comprising the steps of providing a nonconductive plastic mold tool defining a mold cavity (Column 5, lines 49-52); injecting a thermoplastic material into the mold cavity as a liquefied ribbon of material, at a pressure of less than 5000 psi, so that the production thermoplastic material fills the mold cavity (Column 5, lines 1-2, 20-22); cooling the production thermoplastic material in the mold cavity to form the prototype part (Column 5, lines 3-4).

Regarding Claim 10, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, including a method comprising the step of building the mold tool using a rapid prototype technique, based on computer file data representing a desired prototype part (Column 1, lines 6-9).

Regarding Claim 11, Kotnis shows the process as claimed as discussed above in the rejection of claim 10 above, including a method wherein the mold tool is built in a fused deposition modeling machine (Column 1, lines 59-65).

Regarding Claim 12, Kotnis shows the process as claimed as discussed above in the rejection of claim 11 above, including a method wherein the building step and the injection step are performed in the same fused deposition modeling machine (Column 1, lines 59-65).

Regarding Claim 13, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, including a method wherein the injecting step is done in a fused deposition modeling machine (Column 1, lines 59-65).

Regarding Claim 14, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, including a method wherein the mold material is injected into the mold cavity using a melt extruder (Column 1, lines 60-61).

Regarding Claim 15, Kotnis shows the process as claimed as discussed above in the rejection of claim 14 above, including a method wherein the melt extruder comprises a filament pump (Column 1, lines 59-65).

Regarding Claim 19, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, including a method further comprising heating the mold tool to approximately the extrusion temperature, prior to the injection step (Column 9, lines 29-40).

Regarding Claim 22, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, including a method wherein the injection pressure is less than 2000 psi (Column 5, lines 20-22).

Regarding Claim 27, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, including a method wherein the prototype part is cooled in the mold cavity to a temperature approximating room temperature (Column 9, lines 41-45).

Regarding Claim 28, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, including a method further comprising the step of vapor smoothing surfaces of the mold tool prior to the injecting step (Column 9, liens 26-28).

Regarding Claim 29, Kotnis shows the process as claimed as discussed above in the rejection of claim 9, including a method wherein the thermoplastic material is ABS (Column 5, lines 44-48).

Regarding Claim 41, Kotnis shows that it is known to carry out a method for making a prototype plastic injection molded part (Abstract), comprising the steps of providing a non-conductive plastic mold tool defining a mold cavity (Column 4, lines 1-3); providing a supply of two or more reactant materials which form a thermoset resin when reacted together, mixing the reactant materials together (Column 10, lines 42-44); injecting the reactant materials from an extruder into the mold cavity as a liquefied ribbon of material, at a controlled pressure of less than 5000 psi, so that the reactant materials fill the cavity (Column 4, lines 5-7; Column 5, lines 20-22); heating the reactant materials in the mold cavity to form the molded prototype part (Column 10, lines 63-65); cooling the molded prototype part in the mold cavity (Column 10, lines 65-66).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5, 7, 8, 23, 25, 34, 42, and 44 are rejected under 35 USC 103(a) as being unpatentable over Kotnis.

Regarding Claim 5, Kotnis shows the process as claimed as discussed above in the rejection of claim 1 above, including showing an injection pressure of about 1200 psi

(Column 5, lines 20-22). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use an injection pressure of less than 500 psi in order to lower the pressure without removing the utility or applicability of the injection process towards a certain end-use product.

Regarding Claim 7, Kotnis shows the process as claimed as discussed above in the rejection of claim 1 above, including a method including clamping the mold tool to a fixture prior to the injecting step (Column 9, lines 29-40). Although he does not give a specific clamping pressure, It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use a clamping pressure of less than or equal to 10 tons in order to appropriately clamp the molding machine without causing damage to the machine, the molding material, or the final product.

Regarding Claims 8 and 34, Kotnis shows the process as claimed as discussed above in the rejection of claim 1 above, including a method which carefully monitors the heating and cooling of the mold relative to the molding materials and general process (Column 9, lines 29-40). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to design Kotnis' process as an adiabatic one because in a molding operation, a net loss or gain of heat/energy is not desired and may result in damage to the final molded article.

Regarding Claim 23, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, including showing an injection pressure of about 1200 psi (Column 5, lines 20-22). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use an injection pressure of less than 500

psi in order to lower the pressure without removing the utility or applicability of the injection process towards a certain end-use product.

Regarding Claim 25, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, including a method including clamping the mold tool to a fixture prior to the injecting step (Column 9, lines 29-40). Although he does not give a specific clamping pressure, It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use a clamping pressure of less than or equal to 10 tons in order to appropriately clamp the molding machine without causing damage to the machine, the molding material, or the final product.

Regarding Claim 42, Kotnis shows the process as claimed as discussed above in the rejection of claim 41 above, including showing an injection pressure of about 1200 psi (Column 5, lines 20-22). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use an injection pressure of less than 500 psi in order to lower the pressure without removing the utility or applicability of the injection process towards a certain end-use product.

Regarding Claim 44, Kotnis shows the process as claimed as discussed above in the rejection of claim 41 above, including a method which carefully monitors the heating and cooling of the mold relative to the molding materials and general process (Column 9, lines 29-40). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to design Kotnis' process as an adiabatic one because in a molding operation, a net loss or gain of heat/energy is not desired and may result in damage to the final molded article.

Claims 16, 17, 20, 21, 26, and 33 are rejected under 35 USC 103(a) as being unpatentable over Kotnis, in view of Rosato's Injection Molding Handbook (3rd ed.).

Regarding Claim 16, Kotnis shows the process as claimed as discussed above in the rejection of claim 14 above, but he does not show using a piston pump. Rosato shows that it is known to carry out a method wherein the melt extruder comprises a piston pump (Page 147). Rosato and Kotnis are combinable because they are concerned with a similar technical field, namely that of methods of injection molding. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Rosato's piston pump in Kotnis' molding process in order to take advantage of applicable piston pump technologies.

Regarding Claim 17, Kotnis shows the process as claimed as discussed above in the rejection of claim 14 above, but he does not show sprue details. Rosato shows that it is known to carry out a method comprising positioning a sprue in the mold tool such that a dispensing end of the sprue is directed into the mold cavity; attaching an inlet end of the sprue to a dispensing tip of the melt extruder, wherein the thermoplastic material is injected from the melt extruder into the mold cavity via the sprue (Page 263). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Rosato's sprue teachings in Kotnis' molding method in order to most efficiently form the molded article.

Regarding Claim 20, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, but he does not show using a release agent. Rosato shows that it is known to carry out a method comprising coating surfaces of the mold cavity with a release agent, prior to the injecting step (Pages 334, 354). It would have been

prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Rosato's release agent during Kotnis' molding method in order to insure proper release of the molded articles.

Regarding Claim 21, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, but he does not show monitoring steps. Rosato shows that it is known to carry out a method comprising monitoring the pressure in the cavity during the injecting step and responsively adjusting the injection pressure (Pages 692-693). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Rosato's monitoring step during Kotnis' molding method in order to avoid applying too much pressure to the mold or to the molded article and causing any kind of failure.

Regarding Claim 26, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, but he does not show compensating for part shrinkage. Rosato shows that it is known to carry out a method comprising maintaining constant pressure on the mold tool during the cooling step to compensate for shrinkage of the prototype part and the mold tool (Page 445). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to follow Rosato's compensation steps during Kotnis' molding method in order to most accurately form the molded article.

Regarding Claim 33, Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, but he does not show using vacuum assist. Rosato shows that it is known to carry out a method wherein the injecting step is performed using a vacuum assist (Page 150). It would have been prima facie obvious to one of ordinary

skill in the art at the time the invention was made to use Rosato's vacuum assist during Kotnis' molding method in order to most accurately and efficiently form the final article.

Claim 30 is rejected under 35 USC 103(a) as being unpatentable over Kotnis, in view of Gale et al. (U.S. Patent 6,287,428). Kotnis shows the process as claimed as discussed above in the rejection of claim 9 above, but he does not show specific compositions. Gale et al., hereafter "Gale," show that it is known to carry out a method wherein the plastic mold tool is formed from a thermoplastic material comprising at least 50 weight percent of nylon (Column 4, lines 52-54). Gale and Kotnis are combinable because they are concerned with a similar technical field, namely that of methods of forming plastic articles. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Gale's composition during Kotnis' molding method in order to form an article possessing the desired physical and/or chemical properties of the specific composition.

Claims 35-38 and 40 are rejected under 35 USC 103(a) as being unpatentable over Kotnis, in view of Edwards et al. (U.S. Patent 5,938,876).

Regarding Claim 35, Kotnis shows that it is known to carry out a method for making a prototype plastic injection molded part (Abstract) comprising the steps of providing a nonconductive transparent plastic mold tool defining a modl cavity (Column 5, lines 49-52); injecting a liquefied ribbon of polymer into the mold cavity at a pressure of less than 5000 psi, until the material fills the cavity (Column 5, lines 1-2, 20-22). Kotnis does not show using a photopolymer. Edwards et al., hereafter "Edwards," show

that it is known to carry out a method using a photopolymer comprising curing the polymer in the mold cavity by exposing the polymer to light, thereby forming the molded prototype part (Column 2, lines 30-33, 52-56). Edwards and Kotnis are combinable because they are concerned with a similar technical field, namely that of methods of making plastic articles. It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use Edwards' photopolymer in Kotnis' molding method in order to form an article possessing the desired physical and/or chemical properties of the specific polymer.

Regarding Claim 36, Kotnis shows the process as claimed as discussed above in the rejection of claim 35 above, including a method comprising heating the mold tool to approximately the extrusion temperature, prior to the injection step (Column 9, lines 29-40), meeting applicant's claim.

Regarding Claim 37, Kotnis shows the process as claimed as discussed above in the rejection of claim 35 above, including a method wherein the mold material is injected into the mold cavity using a melt extruder (Column 1, lines 60-61).

Regarding Claim 38, Kotnis shows the process as claimed as discussed above in the rejection of claim 35 above, including showing an injection pressure of about 1200 psi (Column 5, lines 20-22). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to use an injection pressure of less than 500 psi in order to lower the pressure without removing the utility or applicability of the injection process towards a certain end-use product.

Regarding Claim 40, Kotnis shows the process as claimed as discussed above in the rejection of claim 35 above, including a method which carefully monitors the heating

and cooling of the mold relative to the molding materials and general process (Column 9, lines 29-40). It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to design Kotnis' process as an adiabatic one because in a molding operation, a net loss or gain of heat/energy is not desired and may result in damage to the final molded article.

Allowable Subject Matter

Claims 6, 18, 24, 31, 32, 39, and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica A. Huson whose telephone number is 571-272-1198. The examiner can normally be reached on Monday-Friday 7:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Colaianni can be reached on 571-272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Monica A Huson
October 3, 2005

MICHAEL P. COLAIANNI
SUPERVISORY PATENT EXAMINER